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REMARKS

The Applicant thanks the Examiner for the courtesy extended in the 9 December 2004 telephone conference between the Examiner and the Applicant's agent. The Applicant submits that this Amendment revises the claims in the manner discussed in the 9 December 2004 telephone conference and places this application in condition for allowance.

Summary of 9 December 2004 Telephone Conference

The Applicant's agent conducted a telephone conference with Examiner Miska on 9 December 2004.

Prior to the telephone conference, the Applicant agent provided Examiner Miska with an exhibit entitled "Proposed claim amendments for application No. 09/991,353 and discussion of US Patent No. 5,101,831 (Koyama et al.)". A copy of that exhibit is enclosed herewith in compliance with the Applicant's duty to make the substance of an interview of record as explained in MPEP § 713.04. The telephone conference involved a discussion of claim 1 (as amended herein) and new claims substantially similar to claims 30-33 (as added herein). The Applicant's agent submitted that each of these claims recites features which patentably distinguish the prior art of record. The Examiner gave a preliminary indication that these new features did patentably distinguish the prior art of record and invited the Applicant's agent to submit revised claims which incorporate these patentably distinguishing features by way of a written Amendment.

Introduction

This application claims apparatus and methods for waking an individual by adjusting an intensity level of a stimulus between a stimulus introduction time and a final wakeup time based on feedback which comprises sensed values of a parameter correlated to the individual's sleep level and based on a difference between a current time and the final wakeup time.

The cited reference, U.S. Patent No. 5,101,831 (Koyama et al.), fails to disclose or suggest apparatus or methods incorporating this combination of features.

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Claims 1-3, 5-11, 24 and 30-33

The Office Action raises Koyama et al. in relation to the patentability of claim 1. The Applicant submits that the amendments to claim 1 patentably distinguishes Koyama et al.

As understood by the Applicant, Koyama et al. discloses monitoring the heart rate of a subject and using the pulse rate to periodically discriminate a sleep state of the subject for a period of time after a start time (Tp) and prior to a desired wakeup time (Tw).

Koyama et al. describes a first waking technique (col. 8, lns. 11-24) which involves discriminating that the subject has terminated a REM sleep state in the time period between Tp and Tw and, upon such a discrimination, introducing a strong and weak stimulus. After the strong and weak stimulus are introduced, they may be increased. Koyama et al. describes a second waking technique (col. 8, lns. 25-46) which involves introducing a weak stimulus at the time Tp and increasing the weak stimulus. When the system discriminates the subject's awakening period or Tw (whichever comes first), then a strong stimulus is introduced. Neither of the Koyama et al. waking techniques disclose or suggest adjusting an intensity level of the strong or weak stimulus between a stimulus introduction time and the wakeup time (Tw) based on heart rate feedback or based on a difference between the current time and the wakeup time (Tw).

Koyama et al. also discloses continuing to monitor the subject's heart rate and periodically discriminating the sleep state of the subject from the pulse rate after the wakeup time Tw (col. 8, lns. 47-61). If the discrimination judges that the person is falling back asleep, then the strong stimulus is continually or intermittently actuated.

Claim 1 has been amended to recite "a controller ... configured to introduce a stimulus at a stimulus introduction time prior to the final wakeup time and, over a period between the stimulus introduction time and the final wakeup time, to adjust an intensity of the stimulus based on feedback which comprises the sensed values of the at least one parameter and based on a difference between a current time and the final wakeup time ..."

This combination of features is not disclosed by Koyama et al. As discussed in the 9 December 2004 telephone conference, Koyama et al. does not teach or suggest adjustment of the stimulus intensity during the period between the stimulus introduction time and the final wakeup time "based on a difference between a current time and the final wakeup

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time". Koyama et al. merely discloses introducing a weak or strong stimulus based on a discrimination of a sleep state (in method 1 and 2) and introducing a weak stimulus at a predetermined time T_p (in method 2).

On the basis of this reasoning, the Applicant submits that claim 1 patentably distinguishes Koyama et al. and all of the other prior art of record.

Claims 2, 3, 5-11, 24 and 30-33 depend from claim 1. Claims 3 and 24 have been amended to reflect the amended language of claim 1. Claims 30-33 are new claims which are substantially similar to the dependent claims discussed in the 9 December 2004 telephone conference and which recite additional novel features of the Applicant's invention. Claims 2, 3, 5-11, 24 and 30-33 are submitted to be allowable for at least the reason that they depend from claim 1.

Claims 12, 25, 26 and 34-37

The Office Action raises Koyama et al. in relation to the patentability of claim 12. The Applicant submits that the amendments to claim 12 patentably distinguishes Koyama et al.

Claim 12 has been amended to recite "a controller ... configured to introduce at least one stimulus at a stimulus introduction time prior to the final wakeup time and to adjust an intensity of the stimulus over a period of time between the stimulus introduction and the final wakeup time based on feedback which comprises sensed values of the at least one parameter and based on a difference between a current time and the final wakeup time ..." As discussed above and in the 9 December 2004 telephone conference, this combination of features is not disclosed by Koyama et al. More specifically, Koyama et al. does not teach or suggest adjustment of the stimulus intensity during the period between the stimulus introduction time and the final wakeup time "based on a difference between a current time and the final wakeup time". Accordingly, the Applicant submits that claim 12 patentably distinguishes Koyama et al. and the other prior art of record.

Claims 25, 26 and 34-37 depend from claim 12. Claims 25 and 26 have been amended to reflect the amended language of claim 12. Claims 34-37 are new claims which are substantially similar to the dependent claims discussed in the 9 December 2004 telephone conference and which recite additional novel features of the Applicant's

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invention. Claims 25, 26 and 34-37 are submitted to be allowable for at least the reason that they depend from claim 12.

Claims 14-16, 18-21, 27 and 38-41

The Office Action raises Koyama et al. in relation to the patentability of claim 14. The Applicant submits that the amendments to claim 14 patentably distinguishes Koyama et al.

Claim 14 has been amended to recite "over a period between the stimulus introduction time and the final wakeup time, adjusting an intensity of the stimulus based on feedback which comprises sensed values of the at least one parameter and based on a difference between a current time and a final wakeup time ..." As discussed above and in the 9 December 2004 telephone conference, this combination of features is not disclosed by Koyama et al. More specifically, Koyama et al. does not teach or suggest adjustment of the stimulus intensity during the period between the stimulus introduction time and the final wakeup time "based on a difference between a current time and the final wakeup time". Accordingly, the Applicant submits that claim 14 patentably distinguishes Koyama et al. and the other prior art of record.

Claims 15-16, 18-21, 27 and 38-41 depend from claim 14. Claims 16 and 27 have been amended to reflect the amended language of claim 14. Claims 38-41 are new claims which are substantially similar to the dependent claims discussed in the 9 December 2004 telephone conference and which recite additional novel features of the Applicant's invention. Claims 15-16, 18-21, 27 and 38-41 are submitted to be allowable for at least the reason that they depend from claim 14.

Claims 22, 28-29 and 42-45

The Office Action raises Koyama et al. in relation to the patentability of claim 22. The Applicant submits that the amendments to claim 22 patentably distinguishes Koyama et al.

Claim 22 has been amended to recite "adjusting an intensity of the stimulus over a period of time between the stimulus introduction time and the final wakeup time based on feedback which comprises sensed values of the at least one parameter sensed during the

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period of time and based on a difference between a current time and the final wakeup time ...” As discussed above and in the 9 December 2004 telephone conference, this combination of features is not disclosed by Koyama et al. More specifically, Koyama et al. does not teach or suggest adjustment of the stimulus intensity during the period between the stimulus introduction time and the final wakeup time “based on a difference between a current time and the final wakeup time”. Accordingly, the Applicant submits that claim 22 patentably distinguishes Koyama et al. and the other prior art of record.

Claims 28-29 and 42-45 depend from claim 14. Claims 28 and 29 have been amended to reflect the amended language of claim 22. Claims 42-45 are new claims which are substantially similar to the dependent claims discussed in the 9 December 2004 telephone conference and which recite additional novel features of the Applicant's invention. Claims 28-29 and 42-45 are submitted to be allowable for at least the reason that they depend from claim 22.

Conclusion

The Applicant has amended the claims to include features indicated by the Examiner to patentably distinguish the prior art in the 9 December 2004 telephone conference. In view of these amendments and the remarks presented above, the Applicant submits that this application is now in condition for allowance and respectfully requests reconsideration and allowance of this application.

Respectfully submitted,
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